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Medium-transfer units for tool interfaces —

Part 1: Transfer units for hollow taper shanks in accordance with the ISO 12164 series

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Unités de transfert de fluide pour les interfaces d'outils —

*Partie 1: Unités de transfert pour queues à cône creux-face conformes
à la série ISO 12164*

<https://standards.iteh.ai/catalog/standards/sist/8f2ca7d2-3ec3-475f-9bbe-8cca477cb20b/iso-fdis-22402-1>

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with defined cutting edges, holding tools, cutting items, adaptive items and interfaces*.

A list of all parts in the ISO 22402 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Medium-transfer units for tool interfaces —

Part 1:

Transfer units for hollow taper shanks in accordance with the ISO 12164 series

1 Scope

This document specifies the dimensions of medium-transfer units for wet processing and interfaces machine tool with insert nuts, which are used in hollow taper shanks taper in accordance with the ISO 12164 series.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

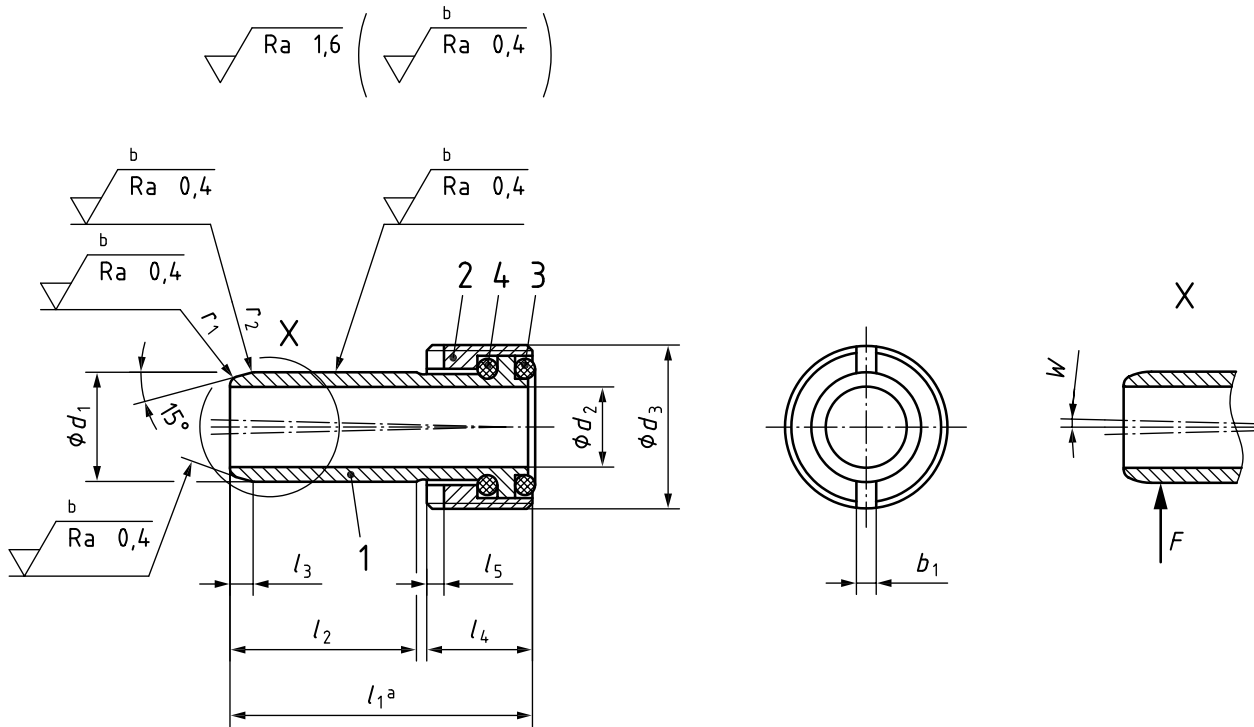
ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Transfer units for wet machining, types and dimensions

4.1 Transfer unit for automatic tool change, type A

The transfer unit of the form A shall be carried out according to [Figure 1](#) and [Table 1](#).



Key

- 1 transfer tube
- 2 threaded bush
- 3 O-ring 1
- 4 O-ring 2
- a In installed condition.
- b Polished.

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Figure 1 — Transfer unit, type A, dimensions

Table 1 — Transfer unit, type A, dimensions

Dimensions in millimetres

Nominal size suitable for HSK-type				20	25	32	40	50	63	80	100	125	160
A	AB	EB	T	20	25	32	40	50	63	80	100	125	160
AS	ES	—	—	25	32	40	50	63	80	100	125	160	—
b_1	$^{+0,2}_0$			1,5	1,5	1,5	2	2	2,5	2,5	3	4	5
d_1	f8			3	5	6	8	10	12	14	16	18	20
d_2				1,8	3	3,5	5	6,4	8	10	12	14	16
d_3				M6 × 0,75	M8 × 1	M10 × 1	M12 × 1	M16 × 1	M18 × 1	M20 × 1,5	M24 × 1,5	M30 × 1,5	M35 × 1,5
l_1	$^0_{-0,5}$			14	17	26	29,5	33	36,5	40	44	48	52
l_2	min			9	11	16	16	19	20	20	23	25	25
l_3				1	2	2,5	2,5	3	3	3	3	3,5	3,5
a				Recommended tightening torque in Nm.									
b				Displacement force in N.									

Table 1 (continued)

Nominal size suitable for HSK-type				20	25	32	40	50	63	80	100	125	160
A	AB	EB	T	20	25	32	40	50	63	80	100	125	160
AS		ES	—	25	32	40	50	63	80	100	125	160	—
l_4	$\begin{matrix} 0 \\ -0,2 \end{matrix}$			3,85	4,5	5,5	7,5	9,5	11,5	13,5	15,5	17,5	19,4
l_5	$\begin{matrix} +0,2 \\ 0 \end{matrix}$			1,4	1,5	1,5	2	2	2,5	2,5	3	3,5	3,5
r_1				0,3	0,4	1	1	1	1,5	1,5	1,5	1,5	1,5
r_2				1,6	1,6	2	2	2	3	3	3	3	3
M_A^a				3	5	5	10	15	20	25	30	30	30
W	min			1	1	1	1	1	1	1	1	1	1
F_{\max}^b				1,5	2,5	5	5	6	6	7	7	9	11
O-ring 1				2,5 × 0,6	4,0 × 1,0	5 × 1,2	7,5 × 1,5	9,0 × 2,0	10,0 × 2,5	13,0 × 2,0	14,0 × 3,0	17,0 × 3,5	20,0 × 3,5
O-ring 2				2,5 × 0,6	4,0 × 1,0	5 × 1,2	7,5 × 1,5	9,0 × 2,0	10,0 × 2,0	13,0 × 2,0	14,0 × 3,0	17,0 × 3,5	20,0 × 3,5

^a Recommended tightening torque in Nm.

^b Displacement force in N.

4.2 Material and heat treatment

4.2.1 General

The transfer unit shall seal a pressure of at least 70 bar¹⁾ and be neutral centred and allow an angular movement with a permissible displacement force (Table 1).

4.2.2 Hardness

The supply tube shall be surface hardened, hardness at least 56 HRC (Rockwell hardness C).

4.3 Designation

A transfer unit, type A in accordance with this document shall be designated by:

- “Transfer unit”;
- reference to this document, i.e. ISO 22402-1;
- type A;
- nominal size of the hollow taper shank in mm (e.g. 50).

EXAMPLE Designation of a transfer unit for wet machining and a hollow taper shank with the nominal size 50 mm

Transfer unit ISO 22402-1 — A — 50

1) 1 bar = 0,1 MPa = 10⁵ Pa 1 MPa = 1 N/mm².

5 Transfer units for machining with minimum quantity lubrication (MQL), types and dimensions

5.1 General

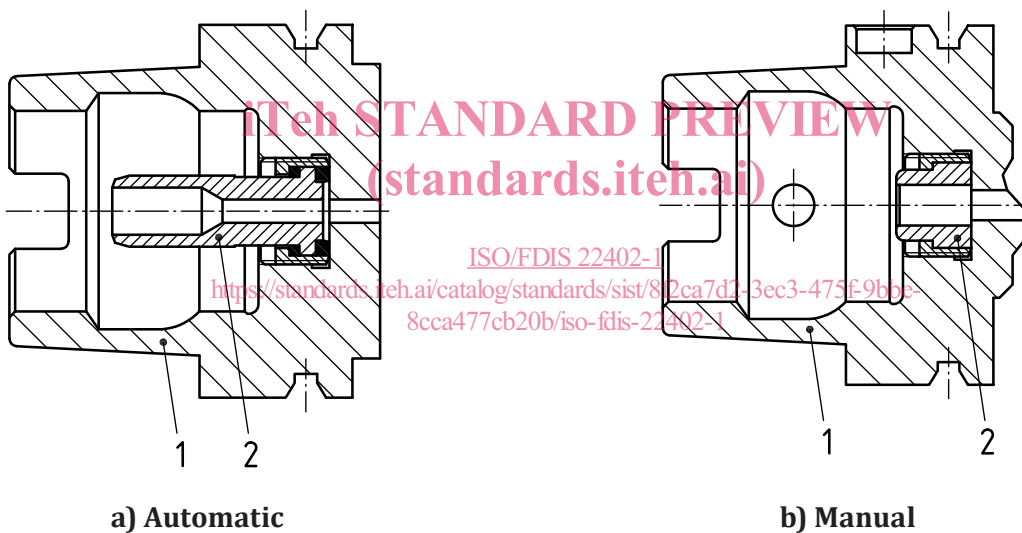
The transfer units described in this document are only used in single-channel MQL systems. In the case of 2-channel MQL systems, precise matching of the cross-sectional areas of the passages to the cutting tool is required and can therefore not be shown or represented in this document.

This clause describes separately transfer units for the automatic and manual (see [Figure 2](#)) tool change.

The transfer unit for the automatic tool change shall seal a pressure of at least 10 bar and be neutral centred and allow an angular movement with a permissible displacement force ([Tables 2](#) and [3](#)).

The selection of the design depends on:

- the continuing cooling channel cross section,
- the length adjustment system, and
- the associated sealing system.



Key

- 1 HSK-A
- 2 transfer unit for tool change

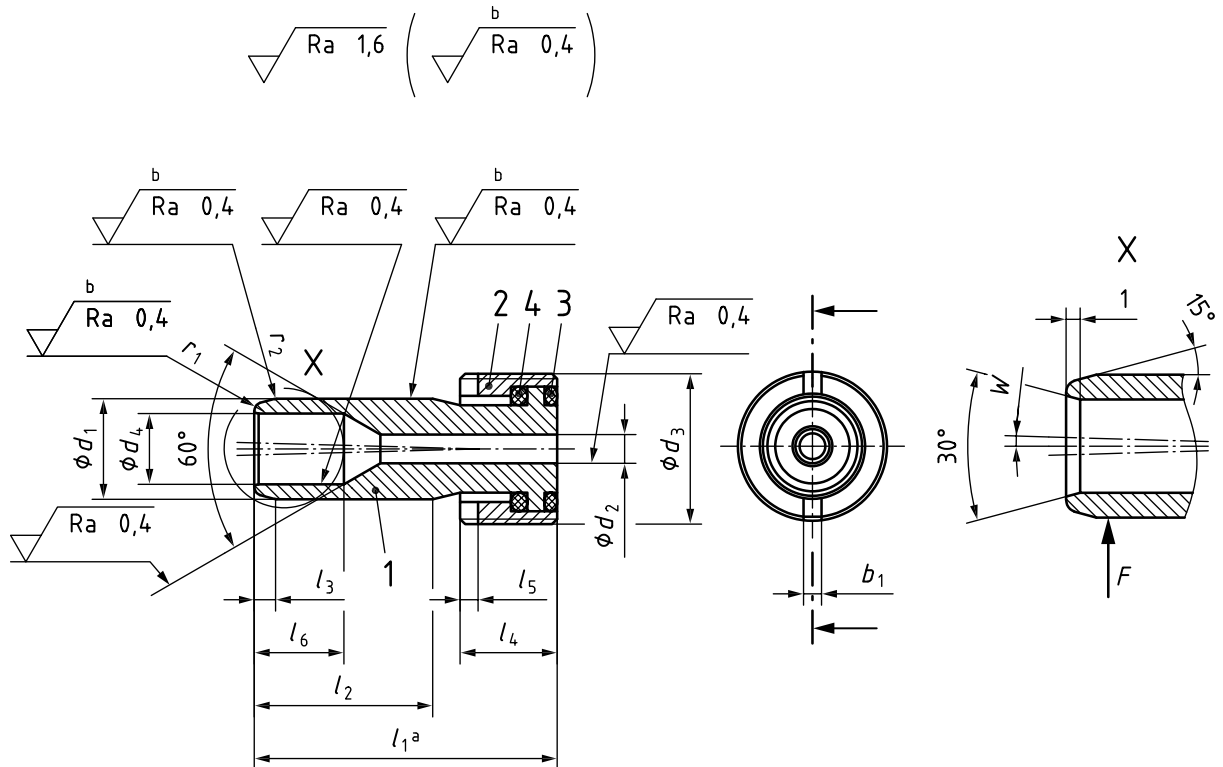
Figure 2 — Transfer unit for tool change

5.2 Transfer unit for automatic tool change

5.2.1 Transfer unit for automatic tool change, type B and C

5.2.1.1 General

The transfer unit of the form B and C for automatic tool change shall be carried out according to [Figure 3](#) and [Table 2](#).



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Key

- 1 transfer tube
- 2 threaded bush
- 3 O-ring 1
- 4 O-ring 2
- a In installed condition.
- b Polished.

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Figure 3 — Transfer unit, type B and C

5.2.1.2 Dimensions

Table 2 — Transfer unit, type B and C, dimensions

Dimensions in millimetres

Nominal size suitable for HSK-type									Transfer unit type
A	AB	EB	T	40	50	63	80	100	
AS		ES	—	50	63	80	100	125	
b_1	$+0,2$ 0			2	2	2,5	2,5	3	B, C
d_1	f8			8	10	12	14	16	B, C
d_2	H9			5	6,4	8	8	8	B
d_2	H9			4	4	4	4	4	C
d_3				M12 × 1	M16 × 1	M18 × 1	M20 × 1,5	M24 × 1,5	B, C
^a Recommended tightening torque in Nm. ^b Displacement force in N.									

Table 2 (continued)

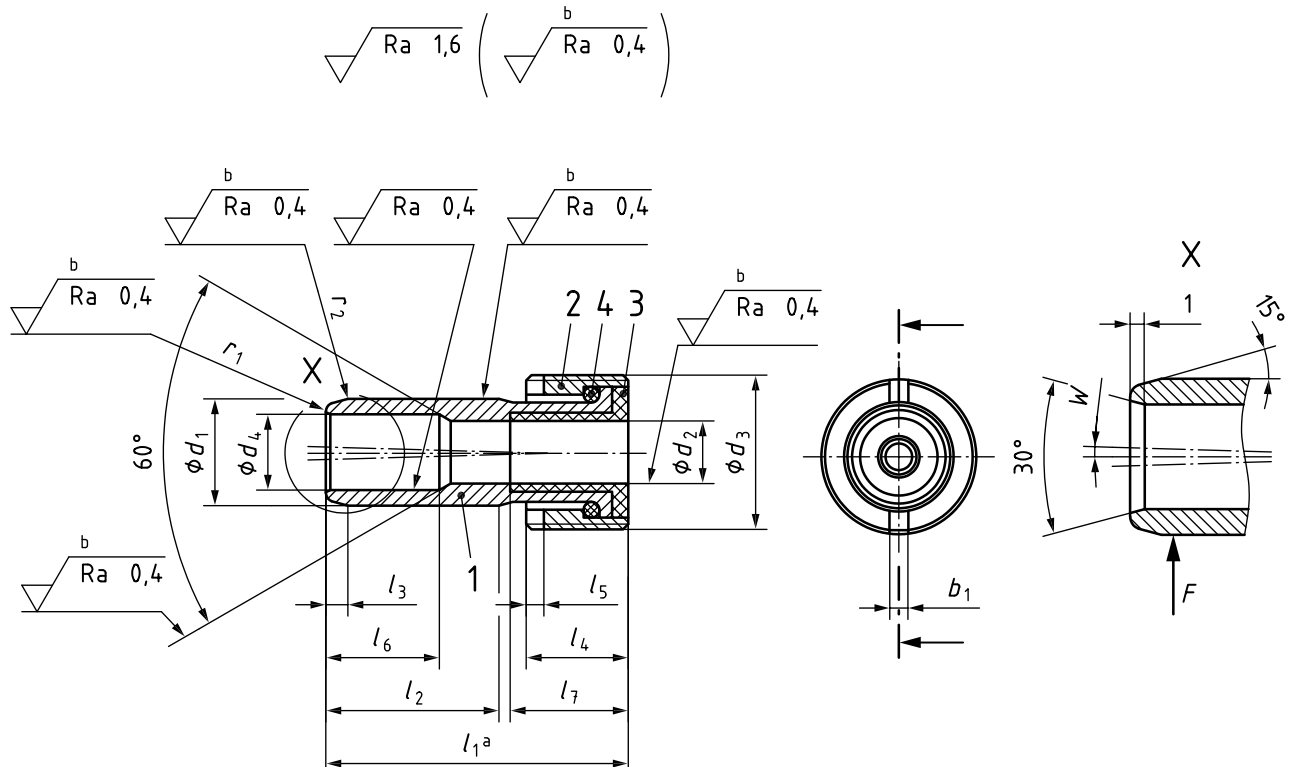
Nominal size suitable for HSK-type									Transfer unit type
A	AB	EB	T	40	50	63	80	100	
AS		ES	—	50	63	80	100	125	
d_4	$\begin{matrix} 0 \\ -0,2 \end{matrix}$			5	6,4	8	10	12	B, C
l_1	$\begin{matrix} 0 \\ -0,5 \end{matrix}$			29,5	33	36,5	40	44	B, C
$l_{2 \text{ min}}$				16	19	20	20	23	B, C
l_3				2,5	3	3	3	3	B, C
l_4	$\begin{matrix} 0 \\ -0,2 \end{matrix}$			7,5	9,5	11,5	13,5	15,5	B, C
l_5	$\begin{matrix} +0,2 \\ 0 \end{matrix}$			2	2	2,5	2,5	3	B, C
$l_{6 \text{ min}}$				—	—	—	16	17	B
$l_{6 \text{ min}}$				15	15	15	16	17	C
r_1				1	1	1,5	1,5	1,5	B, C
r_2				2	2	3	3	3	B, C
M_A^a				10	15	20	25	30	B, C
W	min			1	1	1	1	1	B, C
F_{max}^b				5	6	6	7	7	B, C
O-ring 1				7,5 × 1,5	9,0 × 2,0	10,0 × 2,5	13,0 × 2,0	14,0 × 3,0	B, C
O-ring 2				7,5 × 1,5	9,0 × 2,0	10,0 × 2,0	13,0 × 2,0	14,0 × 3,0	B, C

^a Recommended tightening torque in Nm.
^b Displacement force in N.

5.2.2 Transfer unit for automatic tool change, Type D, E and F

5.2.3 Transfer unit, type D

The transfer unit of the form D is suitable for all tool holders and tool body with machine interface according to ISO 12164-1. The transfer unit of the form D shall be carried out according to [Figure 4](#) and [Table 3](#).



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Key

- 1 transfer tube
- 2 threaded bush
- 3 extension transfer tube with sealing element made of elastic plastic
- 4 O-ring
- a In installed condition.
- b Polished.

Figure 4 — Transfer unit, type D

5.2.4 Transfer unit, type E

Transfer units of form E are only suitable for tool holders and tool carriers with predefined holes suitable for d_5 . The transfer unit of the form E shall be carried out according to [Figure 5](#) and [Table 3](#).